Laboratory Generation of Rayleigh Fading

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Thesis submitted

to

the University of Moratuwa, Sri Lanka

in partial fulfillment of the requirement for the degree of

Master of Engineering

in

Electronics & Telecommunications

September 2006

The work presented in this dissertation has not been submitted for the fulfillment of any other degree

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Acknowledgements

I am very thankful to my supervisor Prof (Mrs.) Dileeka Dias for the guidance and support given to me by her during the pursuit of my Master's degree. She has been very helpful and I am grateful for her willingness and readiness in giving direction to my thesis work.

I would like to thank Mr. Chandana Peiris for his invaluable ideas and suggestions during the course of my thesis work.

Last, but not least, I would like to thank my family who were a source of constant support and encouragement.

Abstract

Mobile radio channel simulators are essential for repeatable system tests in a development, design, or test laboratory. Due to the random, uncontrollable nature of the mobile propagation path, it is difficult to generate repeatable field test results. Also doing field tests in a mobile environment is considerably more expensive.

An approach for hardware simulation of Rayleigh fading is presented in this thesis. The heart of the simulator is a Digital Signal Processor (DSP), which implements the random noise and the digital filtering necessary for the generation of a Rayleigh faded signal.

The results indicate that the proposed hardware simulator can simulate Rayleigh fading with a high degree of accuracy. The envelope of the generated Rayleigh fading had been observed by an Oscilloscope. The observations have been done also for carrier frequency of 900MHz.

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